ago, showed that gas from wells located in districts not connected with each other was similar in composition, but that the percentages of the different gases present varied widely; and more recent analyses show that gas from wells in the same 'pool,' and even that from the same well, is subject to daily and even hourly variations in composition. When it was found that the calorific value of the fuel was subject to change from time to time, as shown by variations in temperature of the furnaces, and in the steam-pressure of boilers under which it was burnt, this was at first supposed to be due to differences in pressure; that is, in the quantity of gas delivered to the burners in the fire-box. Automatic pressure regulators were introduced, and the producing companies perfected a system by which the pressures were maintained at a nearly constant figure, yet the same variations were observed. The chemists then began to examine the gas, and soon found that it was extremely variable in composition. The following table shows the results of ten analyses of natural gas, the first four being made from gas taken from the same well at different times, and the others from the gas of different wells in different districts: —

	1	2	3	4	5	6	7	8	9	10
Carbonic acid (CO_2)	.80	.60	–	.40	.34	.35	.66	2.28	–	.30
Carbonic oxide (CO)	1.00	.80	.58	.40	trace	.26	trace	–	1.00	.60
Hydrogen (H)	20.02	26.16	29.03	35.92	6.10	4.79	13.50	22.50	9.64	14.45
Marsh gas (CH_4)	72.18	65.25	60.70	49.58	75.44	89.65	80.11	60.37	57.85	75.16
Ethane (C_2H_6)	3.69	5.50	7.92	12.30	18.12	4.39	5.72	6.80	5.20	4.80
Propane (C_3H_8)	–	–	–	–	trace	trace	–	–	–	–
Nitrogen (N)	–	–	–	–	–	–	–	7.32	23.41	2.89
Oxygen (O)	1.10	.80	.78	.80	–	–	–	.83	2.10	1.20
Illuminating hydrocarbons	.70	.80	.98	.60	–	.56	–	–	.80	.60
Ratio, C to H (weight)	2.72	2.59	2.64	2.59	3.08	3.00	2.88	2.70	2.91	2.84

SUPAN'S JOURNAL OF COMMERCIAL GEOGRAPHY.

THE latest supplement of *Petermann's Mittheilungen* forms the first number of a journal of commercial geography. Prof. A. Supan, the able editor of the *Mittheilungen*, intends to give in the new periodical at regular intervals a report on the agricultural and industrial produce and of the commerce of all continents successively. The present number contains a brief introduction and the report on America. The principal feature of the new journal is the use of the results obtained by statistical observations for geographical purposes. German geographers of late apply much of their time and work to studying the mutual relation between geographical phenomena and the history of mankind. We call to mind Ratzel's 'Anthropogeographie,' which gave rise to numerous discussions, and was an incentive to many researches of a similar kind. The new periodical belongs to this class of publications. Supan sets forth his plan in the introduction. He intends to give a collection of reliable data arranged from geographical points of view. Thus he hopes to give material that will be useful by its clearness, and will enable the student to investigate the history of commercial life. "Whoever intends to study the relation between man and nature," he says, "must not confine his researches to a brief period. I am convinced that the geography of civilization must be studied from an historical stand-point. Here is the place where geography and history will meet again; this is the way in which geography may become a practical science in the noblest sense of the word."

Supan arranges the statistical data contained in the report of the tenth census of the United States into four principal groups, and proves that the north-eastern states have largely an industrial population. In the central group industrial and agricultural population are almost of equal importance, while in the southern the agricultural one predominates. In the western states the influence of the mineral resources is characteristic. Supan's discussion of the agriculture of North America is accompanied by several maps which give a clear idea of the distribution of cultivated land and of the culture of wheat cotton, and tobacco. The tables are so arranged as to show the moving of the principal district of production from east to west which began between the years 1850 and 1860. In 1850 the maximum of production was found in the southern Atlantic states; in 1860 it had moved to the Mississippi-Ohio group. At the same time the minimum moved from the prairie states to the plateaus. The agriculture of the whole east shows a permanent decrease, the northern-central and the western states a permanent increase of their relative importance, while the southern states have remained stationary. The rapid increase of the importance of agriculture which prevailed in the Mississippi and Ohio group during the last thirty years has ceased,

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and in their stead the prairie states are rapidly developing.

We point out only a few of the important results Supan obtained by the geographical arrangement of statistical data and of his critical remarks on the available material. In studying the industry and agriculture of the United States, he again divides them into four groups, — the north-eastern industrial district, the southern and central agricultural district, the mining district of the western plateaus, and the Pacific district, in which agriculture prevails while mining and industry are of considerable importance. The character of the United States is still that of an agricultural country, but industry is growing rapidly upon agriculture. As compared to these, mining is insignificant, the whole mineral production being only eighteen per cent of the agricultural. As we approach the southern states, the industry decreases, while agriculture increases. Going west, industry decreases, and is a minimum in the prairie states; farther west its importance is again increasing. The north-eastern states have changed their character from that of agricultural states to industrial ones. The industry of the United States is founded upon the produce of agriculture, and every province works up its native material, — the southern states, cotton; the southern-central states, tobacco, iron, etc. The New England states form the only exception. Cotton, wool, and leather manufacture are the predominating industries, — though cotton does not grow there, — and stock-raising is of no importance. The industry of this region has the same character as that of England. It consumes for manufacture the produce of foreign countries. A map accompanying the report illustrates the distribution of industrial production in North America.

The data on the commerce of the United States do not refer to 1880, as those on production do, but are the mean of the five years 1880–84. Supan prefers this method on account of the irregular fluctuations, which are of greater importance in commerce than in production. He arranges the commerce of the seaports so as to show that those of the northern Atlantic coast are importing while the southern ones are exporting. In the interior the lake district as far as Cleveland is importing; farther west it is exporting. On the Pacific coast the northern ports are exporting, the southern ones are importing, while in San Francisco both branches are of equal value. The export of manufactures is steadily increasing in value as compared to that of agricultural produce.

The statistical data on Canada show that the proportion of the industrial and agricultural population is about the same as in the United States. The principal difference is, that the proportion is evenly distributed in all parts of Canada, while very wide differences exist throughout the United States. Canada is now in a stage the United States passed through before the rapid development of the western states and territories. The western provinces of Canada are not yet as far developed as those of the United States, and the shifting of production to the prairies, which has been going on here for more than thirty years, has scarcely begun there.

The present volume shows that results of eminent practical value may be obtained by the application of geographical methods to sociological problems. It opens new points of view to the student of political economy, showing the close connection between man and the country he inhabits.

F. BOAS.

STARTING from the common observation that when we do hard thinking we cannot at the same time use our muscles actively, Dr. J. Loeb (*Pflüger's Archiv f. Physiologie*) has attempted to estimate quantitatively the relation between physical and psychical activity. His method was to record his maximum grip on a dynamometer; then, after a short rest, to begin some mental work; and, while engaged in this, to record the maximum grip once more. The result was, that the latter grip was decidedly less powerful, and that the difference between it and the former grip was the greater, the more difficult and absorbing the mental process. For instance: in one case the normal grip with the left hand depressed the lever of the dynamometer to 77°; while reading and *understanding* (i.e., he could repeat the substance of it in his own words) a scientific work, only to 15°; while simply reading it as so many sounds, 67°. Another gentleman (Professor Zuntz) could normally depress the lever to 69°; but, while reading a catalogue of names (requiring little mental strain), to 53°. Dr. Loeb's average maximum grip when not occupied with mental work was (mean of both hands) a depression of the lever to 85°; while multiplying one number under 10 by another such number, the depression was 81°; when the two numbers were between 10 and 20, only 35°; when between 20 and 30, only 14°. This shows very clearly how the energy given over to the mental exertion is taken off from the muscular effort. It must, of course, be understood that these results have only a general value. The method presents many mechanical difficulties; the question of attention is an important factor; and Dr. Loeb simply offers these results as a preliminary statement of his intention to work upon this problem.